termination, as some earlier naturalists have supposed. G. C. Whipple and Horatio N. Parker present 'A Note on the Vertical Distribution of Mallomonas.' While the reasons for the peculiar distribution are not wholly apparent, it apparently depends on light and temperature, the organism preferring to live where the light is strong, the temperature low and the water quiet. In an article on 'The Colors of Northern Monocotyledonous Flowers' John H. Lovell considers that the primitive color of the perianth was green, that physiological conditions have often played an important part in determining the coloration of the petals, while insects have contributed to the fixation of such characters when once acquired. William L. Tower records the curious 'Loss of the Ectoderm of *Hydra Viridis* in the Light of a Projection Microscope,' this loss occurring almost completely in from one to eleven minutes. The diagrams illustrating this paper have been transposed. The editor makes the welcome announcement of the forthcoming publication in the *Naturalist* of a series of synoptical tables for the determination of American invertebrates.

*Bird Lore* for June commences with an all-too-brief note by Frank M. Chapman on 'Gannets on Bonaventure,' accompanied by a full-page plate showing the nesting gannets on one of the ledges. Florence A. Merriam concludes her article on 'Clark's Crows and Oregon Jays on Mount Hood,' and Mary F. Day gives some excellent observations on the Chimney Swift under the caption 'Home-Life in a Chimney.' William L. Baily shows 'Three Cobb's Island Pictures,' with notes thereon. Ella Gilbert Ives writes of 'The Cardinal at the Hub,' and Thos. S. Roberts has an illustrated 'Catbird Study.' Olive Thorne Miller discusses 'The Ethics of Caging Birds,' deciding that this may be done, if properly done. Fred. H. Kennard tells of the birds of 'A May Morning,' and Mildred A. Johnson of those seen on 'A February Walk.' If one might venture a criticism on *Bird Lore* it would be to the effect that the 'young observers' seem to be getting more than their fair share of space.

*Terrestrial Magnetism and Atmospheric Electricity* for June. As already announced in SCIENCE, this journal is now being issued from the Johns Hopkins University press, Dr. Bauer remaining as editor-in-chief. In view of the addition of atmospheric electricity to the scope of the journal an appropriation has been made to it from the Hodgkins fund of the Smithsonian Institution. The contents of the number before us are as follows: Portrait of Charles A. Schott, Frontispiece; 'The Beginnings of Magnetic Observations,' G. Hellmann; 'Carte Magnétique de la Sicile,' L. Palazzo; 'The Magnetic Work of the United States Coast and Geodetic Survey,' L. A. Bauer; Über einige Probleme des Erdmagnetismus und die Nothwendigkeit einer Internationalen Organisation,' M. Eschenhagen; 'The Secondary Magnetic Field of the Earth,' A. W. Rücker; 'Remarks upon Professor Rücker's Paper and Wilde's Magnetarium,' L. A. Bauer; 'Biographical Sketch and Portrait of Dr. John Locke,' L. A. Bauer; 'Mean Values of Magnetic Elements at Observatories,' C. Chree; Notes, 'Biographical Sketch of Charles A. Schott.' Activity in magnetic work.

## SOCIETIES AND ACADEMIES.

### GEOLOGICAL SOCIETY OF WASHINGTON.

At the meeting of this Society, held on May 10, 1899, three papers were read, of which abstracts follow:

Mr. S. F. Emmons read a paper entitled '*Plutonic Plugs and Subtuberant Mountains*,' new terms introduced by Professor I. C. Russell in two articles in Volume IV. of the *Journal of Geology* (1896), to designate hitherto unobserved geological phenomena, the one being a new form of igneous intrusion distinct from laccoliths, the other a new type of mountains. The latter, to which his second article is devoted, are dome-shaped mountain uplifts with granitic cores, which he considers to have resulted from the vertical upthrust exercised by the intrusion of a larger plutonic plug (or *tuber*) beneath their center, and are called by him 'subtuberant mountains.' The idea of vertical upthrust had already been advanced by Dutton in his article on Mt. Taylor, N. M., in which he stated that all the mountain uplifts between the Great Plains and the Sierra

Nevada had been produced by rising granite cores, which might or might not have reached the surface or been exposed by erosion. So far as facts in support of this theory were instanced by Professor Russell for regions that had come under the speaker's observation, Mr. Emmons said they were not correctly stated or interpreted, and that Russell had apparently taken his ideas with regard to the Colorado mountains rather from the early reconnaissance observations of Hayden than from what had been written since in the light of modern geological research. It was only during the past summer, however, that an opportunity had presented to verify the personal observations in the northern Black Hills, upon which Russell based his original discovery. A detailed survey of this region is in progress by members of the U. S. Geological Survey, under Mr. Emmons's general supervision, the results of which, though not ready for publication, show that Russell's own observations, which were confined to three outlying groups of hills, were inaccurate. His supposed plugs are either laccoliths or remnants of laccolithic sheets left by erosion. In describing the other occurrences to support his plug theory Russell had relied mainly on the reconnaissance observations of Winchell and Newton made 25 or 30 years ago, before laccoliths were known, and paid little attention to later observations. In point of fact, the region presents a most remarkable variety of typical laccoliths, and nothing corresponding to the supposed plutonic plug has yet been observed there. Russell's further statement in support of the plug theory, 'that dikes and faults are wanting in the region,' is equally without basis of fact. Crosby, in the article casually referred to by Russell, speaks of the abundance of dikes in certain localities, and observation has shown that both dikes and faults are so abundant in the central mining region that they could hardly escape notice.

The speaker thought such hasty generalizations were objectionable as establishing an undeserved priority in terms that when accurately defined and applied to observed phenomena might be useful to field geologists.

This paper was followed by one upon *Laccoliths and Bysmaliths*, by Walter Harvey Weed, the subject being a sequel to that previously discussed. The facts upon which the paper was based related mainly to the igneous intrusive mass of the Little Belt Mountains, of Montana, in which careful areal surveys have been made, but supported by observations made for ten years past in neighboring parts of the State. These intrusions commonly occur in Cambrian shales, and rest upon crystalline schists. They present gradations from intrusive sheets to laccoliths, and from these to asymmetric laccoliths. Incidentally, it was shown that the asymmetry is due to the general range uplift, furnishing a line of weakness along the limb or monoclinal of the fold. Several of the intrusions are, however, unlike the laccolith, unless we assume an asymmetry about the entire circumference. In other words, faulting and uplift, and not folding, is the prevailing structure. As the field observations show the same spreading out on a definite floor as in the case of the laccolith, these intrusions are not stocks or the so-called plugs of many writers, a term lately revived under the title of Plutonic Plug by Russell. Moreover, gradations occur between them and the asymmetric laccolith.

For such intrusions Professor J. P. Iddings has recently proposed the name of *bysmalith*. It is clearly a form heretofore embraced under the more general term of 'stock.' Its usefulness consists in its affording a definite name for a definite type of intrusion, of which several examples have now been observed.

From a study of the facts observed in the field, it appears that there is a definite relation between these different forms of intrusion, and the form is a function of several factors. The other factors being equal, and lines of weakness absent, a bysmalith has a larger floor area than the laccolith, which accords with the hypothesis that owing to viscosity of the intruding magma the pressure in large masses is imperfectly transmitted laterally, resulting in an increased upthrust producing faulting and the punching upward of the strata. Such intrusions have been described by Davis and Lindgren, though no name was given them. As the term laccolith is preferable to stone cistern, so bysmalith is preferable to plug-stone, both having special meanings not implied by the English transla-

tions of the names, especially as the term plug as used by geologists, including Russell, does not imply lateral expansion.

The third and last paper was by Mr. J. A. Taff. Mr. Taff's observations on '*Changes in the Canadian River in Western Choctaw Nation, Ind. Ter.*,' brought out facts showing that this river once flowed from where it now crosses the Choctaw-Chickasaw line southeastward, well into what is now the hydrographic basin of Red River; that the present river has eroded its bed 100 feet below its old channel; that the old river was 1 to 3 miles wide and had filled its channel with sand, as the present river has done. The migration of the Canadian northward was shown to be, most probably, due to capture by a tributary of Little River by headwater erosion along the strike of friable beds of sandstone and shale. The old channel of Canadian River was surveyed and mapped for 50 miles.

Wm. F. Morsell.

May 15, 1899.

### TEXAS ACADEMY OF SCIENCE.

The annual June meeting of the Academy was held at Austin on the 12th inst. The following papers were presented:

1. Some Theorems in Geometry: Dr. W. H. Bruce, Athens, Texas.
2. Southwestern Texas: William Kennedy, Austin.
3. The Ecology and Embryology of the 'Rain Lilies:' Felix E. Smith, Austin.
4. 'An Annotated Record of the Geology of Texas for the Decade Ending December 31, 1896,' with remarks: Dr. Frederick W. Simonds.
5. A Case of Fistula on the Neck of an Adult Man: Dr. W. W. Norman.
6. The Behavior of Certain Caterpillars: Dr. W. W. Norman.
7. Life Zones and Crop Zones in Texas: Dr. William L. Bray.

The election of officers, which occurs annually in June, resulted in the following choice:

President, Dr. Frederic W. Simonds, University of Texas.

Vice-President, R. S. Hyer, Regent of Southwestern University, Georgetown, Tex.

Treasurer, Professor T. U. Taylor, University of Texas.

Secretary, Dr. William L. Bray, University of Texas.

Librarian, Dr. W. W. Norman, University of Texas.

First Member of Council, H. L. Hilgartner, M.D., Austin, Tex.

Second Member of Council, Professor J. C. Nagle, Agricultural and Mechanical College, College Station, Tex.

Third Member of Council, Dr. H. W. Harper, F.C.S. London, University of Texas.

The office of Librarian was created by vote of the Academy, and the Librarian made *ex-officio* member of the Council. The Academy library, consisting thus far of valuable exchanges, is assuming gratifying proportions.

William L. Bray, *Secretary.*

### TORREY BOTANICAL CLUB, MAY 31, 1899.

On the part of the Committee on Nature Study, Miss Sanial described briefly the use of plant material in the vacation schools of New York City, and the need of donations of fresh flowers and other natural objects. They are used for study and for brush work. Many of the children have never seen any wild flowers whatever. Any one who will write to the Board of Education, labeling the communication 'For Vacation Schools,' will receive the necessary blanks for forwarding, and such contributions of plant material are earnestly desired.

Dr. Arthur Hollick followed with a brief abstract preliminary to a paper entitled 'A Comparison between Geological Sequence and Biological Development in the Vegetable Kingdom.'' He alluded to the first occurrence of modern genera in the Mesozoic, and of modern species in the Tertiary; and to the vigorous growth made by lower forms of algæ in the hot waters of Yellowstone Park, suggesting that similar algal life was probably characteristic of the earlier heated waters of the globe. He stated that many of the Cambrian casts claimed to represent algæ are undoubtedly rightly interpreted; and then sketched the successive appearances of the earliest known gymnosperms, in the Devonian, monocotyledons, in the Triassic, and dicotlyedons in the Cretaceous, by the middle of which period many modern genera are recognized. Ferns and Lycopods of modern families appeared in

the Devonian, the first known Musci, Hepatica and Fungi in the Tertiary. Plant remains in glacial deposits are exactly the same as species now living a little farther to the north. The Carboniferous fern-species which have been figured and named outnumber those of the whole world now living. The coal flora was probably practically identical all over the world. Every time a new horizon is opened up, even down to the Tertiary, there are many new fossil ferns discovered in it. A species in paleobotany simply means a description of a certain organism. We may find that some or many of these actually belong to the same species.

Discussion followed, in which Dr. Underwood, Mr. Eugene Smith and the Secretary participated. Dr. Underwood called attention to the descent of the ferns, not from the mosses, but probably from earlier generalized ancestors of both; and spoke of the disparity in numbers between the fossil and the living ferns of Pennsylvania—45 living, but at least 375 fossil—and and asked: "How many of the 45 now living in Pennsylvania are at present being preserved in sediments?" Many of them are seldom found above ground, to say nothing of their occurrence beneath.

The second subject presented was the exhibition and description of a hygroscopic plant-specimen by Dr. C. J. Eames. The specimen was originally described in an article entitled 'The Resurrection Flower' in *Harper's Monthly*, April, 1857, p. 619. Dr. Eames' specimen seemed as if it were the ripened circle of ovaries of some malvaceous flower, and displayed very marked hygroscopic movement, expanding completely within fifteen minutes after moistening. Dr. Eames, a chemist, obtained his specimen in 1860 from Dr. I. Deck, a chemist, who said that he had secured this, and one other like it, about 1849 when in Upper Egypt. The other specimen passed into the possession of Humboldt. Dr. Eames exhibited specimens of *Selaginella* and *Anastatica* for comparison, their hygroscopic movement being less perfect. In the discussion following Dr. Schoeney stated that he has retained *Equisetum* spores which have held their hygroscopic power for ten years unimpaired.

EDWARD S. BURGESS,
*Secretary.*

## *BOTANICAL NOTES.*

### THE POPULARIZATION OF BOTANY.

FROM time to time attempts are made to popularize some department of science, with less or more success according to the abilities of the author. In this country we have had many illustrations of how not to do such a work, with a few examples which have been successful. Botany has perhaps more than any other science suffered from the attempts of unprepared authors, and, as a consequence, we have had a swarm of books and booklets filled with all kinds of misinformation in regard to plants. It is little, if any, better abroad, but there one finds, now and then, a really good book which is popular in style and yet accurate in regard to its matter. Perhaps the explanation of the latter fact may be found in the other fact that occasionally an eminent botanist undertakes the task of writing for the people. One of the latest illustrations of this is the third edition of Van Tieghem's 'Eléments de Botanique.' That the author is thoroughly prepared to present the subject needs no discussion here, and an examination of the text shows that he has been able to present it in such form as to make it readable to any one of ordinary ability. This result has been attained by the use of vernacular terms, or, where these did not exist, by the modification of technical terms into forms which so nearly resemble the vernacular as to be readily accepted by the ordinary reader. In this manner the author is able to discuss, in successive chapters, topics like the following: the body of the plant, the root, the stem, the leaf, the flower (in all of which the morphology is first taken up and then followed by the physiology), development of the phanerogams, formation of the egg and development of vascular cryptogams, formation of the egg and development of mossworts, formation of the egg and development of thallophytes, development of the race. In the second part of his book the author boldly takes his readers through the difficult field of systematic botany, from thallophytes to phanerogams, closing with a chapter on the distribution of plants.

We do not have to agree with what we must regard as little better than scientific vagaries in some portions of the author's discussions of the